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## RESULTS OF THE ARCHBOLD EXPEDITIONS. No. 31

### NEW RODENTS AND MARSUPIALS FROM NEW GUINEA

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The large collection of mammals assembled by the Archbold Expeditions of 1936 and 1938 to New Guinea, contains many interesting novelties, some of which are here described.

The 1938 party made its base at Hollandia on the north coast of the island whence, using a large aeroplane, it established field bases on the Idenburg River and on Lake Habbema (3300 meters), on the northern slopes of Mt. Wilhelmina.

From Bernhard Camp (60 meters), the base on the Idenburg, subsidiary stations were occupied up the slopes to the crest of the range south of the river, the altitudes of which were recorded as 850, 1200, 1800, 2100 meters, respectively.

From Lake Habbema two main lines of camps were prepared. One chain of stations reached downward, following the courses of the Bele and Balim Rivers (with drainage to the south coast of New Guinea)—through altitudes of 2800, 2200 and 1600 meters. A second series of stations passed to the eastern side of Mt. Wilhelmina and then drove upward to collecting stations at 3560 and 3800 meters. Thus the entire northeastern fall from Mt. Wilhelmina was ransacked for species at all elevations between 60 and 4000 meters.

The new forms come chiefly from the heavy lowland forests of the Idenburg River where they seem to have been rare and are represented often by single specimens; and from the high country above 2000 meters, in which case large series are available for study.

The 1936 expedition<sup>1</sup> placed its headquarters on the Island of Daru near the

mouth of the Fly River. Thence stations were established all the way up the Fly River and into the Central Mountain range to an altitude of nearly 1000 meters. Work was done also along the south coast of the Western Division of Papua at Mabadauan and Strachan Island, and in the Central Division northeast of Port Moresby up to Kagi, 1600 meters.

The mammals brought back by the 1938 Expedition were collected by W. B. Richardson; those of the 1936 Expedition by G. H. H. Tate. Both Richardson and Tate employed native collectors to help them. Measurements, unless otherwise stated, were taken by Richardson or Tate.

Colors printed with capitals are those of Ridgway.<sup>2</sup>

#### PARALEPTOMYS, NEW GENUS

This genus needs comparison only with *Leptomys*, from which it is separated by its normal hind foot (elongated in *Leptomys*), and by the absence of  $m_3^2$ .

GENOTYPE.—*Paraleptomys wilhelmina*.

#### *Paraleptomys wilhelmina*, new species

TYPE.—No. 150512, Amer. Mus. Nat. Hist.; adult ♂; 9 kilometers NE. of Lake Habbema, near Mt. Wilhelmina, Netherlands New Guinea; altitude 2800 meters; October 15, 1938; collector, W. B. Richardson (field No. 5143), 1938 New Guinea Expedition. The type is a skin with skull in good condition.

GENERAL CHARACTERS.—Superficially very like certain brownish-gray mountain inhabiting *Melanomys*. Differs sharply from *Leptomys* (with elongate feet and pure white ventral hairs), from *Pseudohydromys* (shrew-like), and from *Microhydromys* (*Mus*-like).

DESCRIPTION OF TYPE.—Skin dorsally colored near Bone Brown, very slightly intensified along the back; ventrally dull white, with gray bases

<sup>1</sup> For full report see Rand, A. L., and L. J. Brass, 1940, Bull. Amer. Mus. Nat. Hist., LXXVII, No. 29, pp. 341-380.

<sup>2</sup> Ridgway, 1912. Color Standards and Nomenclature.

which amply show through the white tips. Ears large, gray; hands and feet thinly covered with whitish hairs. Tail light fuscous above, white beneath, its terminal 1.5 cm. white. Tail-scales simple, flat, rounded to slightly hexagonal, 14 per cm. Scale-hairs 3 per scale, about one scale-length, whitish. Skull: in many respects very like *Leptomys*; rostrum, braincase, zygomatic plate, palate, pterygoid region and bullae are essentially the same. Differs in the absence of  $m_3^3$  (reduced but still 3-rooted in *Leptomys*), and the diminution of flare of the maxillary root of the zygoma.

MEASUREMENTS OF TYPE.—Skin: total length, 261 mm.; tail, 135; hind foot (s.u.), 31; ear from crown, 17. Skull: condylo-incisive length, 29.2; zygomatic breadth, 16.0; length of nasals, 12; interorbital breadth, 5.7; breadth of interparietal, 7.3; breadth of braincase, 13.5; height of muzzle at level of front of incisive foramina, 5.8; palatal length, 14.5; palatal foramina,  $4.8 \times 2.3$ ; diastema, 7.6; breadth between  $m_1^{-1}$ , 2.9; breadth of mesopterygoid fossa, 2.1; bulla,  $4.9 \times 3.6$ ; width between bullae, 4.0; mastoid width, 12.2. Teeth: length  $m^1 + m^2$ , 4.5;  $m^1$ ,  $3.0 \times 1.8$ ;  $m^2$ ,  $1.6 \times 1.5$ ;  $m_1 + m_2$ , 4.6;  $m_1$ , 2.7;  $m_2$ , 1.8.

Assumption by  $m^2$  of the terminal position in the tooththrow has so modified its form that the postero-external tubercle has been eliminated. In *Paraleptomys*  $m^1$  differs from that of *Leptomys* in being slightly broader. But a more important difference is observed in the relatively great depth of the fissures separating the three laminae of  $m^1$ , seen from the outer face of the tooth. Said fissures reach a depth of 0.5 mm.—virtually to the level of the cingulum. In *Leptomys* the fissures either do not develop at all or remain minute (0.2).

*Paraleptomys wilhelmina* is represented in the collection obtained by Mr. Richardson by almost 50 specimens, all from the Lake Habbema region between 2200 and 3000 meters. A second series of 30 specimens from camps on the heights (1800–2100 meters) SW. of Bernhard Camp between the Idenburg River and its affluent, the Hablifoert River, may be separable as a faintly differentiated race. This slight difference is inconstantly manifested by the form of the anterior margin of the zygomatic plate; less excised in the Idenburg animals, more excised in the Habbema race. The two areas of distribution are made continuous by way of the highlands

connecting the Doorman Top ranges with the Wilhelmina uplands.

#### MICROHYDROMYS, NEW GENUS

The smallest known Hydromyine, and unique in possessing grooved upper incisor teeth. Pelage, ears, tail and lips without modifications for aquatic habitus. Feet neither modified for swimming nor elongate as in *Leptomys*. Skull exhibiting the short, broad muzzle and widened interorbital region and braincase of *Parahydromys*, but the bullae, although low, are very much larger and proportionally much closer together (width of bullae, 2.9; distance apart of bullae, 2.0); zygomatic plate essentially as *Hydromys* and *Pseudohydromys*; palatal foramina more as in *Leptomys*, less shortened than in *Hydromys*; nasals unshortened.

TEETH.—Upper incisors with distinct groove separating anterior face of tooth into an outer third and an inner two-thirds. Molars reduced to two in each row, as in most Hydromyinae, but the toothrows wider spaced in the palate and less convergent anteriorly than in *Parahydromys* and *Hydromys*, the arrangement being essentially that of *Pseudohydromys*.

GENOTYPE.—*Microhydromys richardsoni*.

#### *Microhydromys richardsoni*, new species

TYPE.—No. 152079, Amer. Mus. Nat. Hist.; adult ♂; 4 kilometers SW. of Bernhard Camp, Idenburg River, Netherlands New Guinea; altitude 850 meters; March 16, 1939; collector, W. B. Richardson (field No. 7677), 1938 New Guinea Expedition. The type is a skin in good condition, and skull with braincase badly broken.

GENERAL CHARACTERS.—A blackish murid about the size of a housemouse, externally unspecialized; with terminal centimeter of tail white.

DESCRIPTION.—Skin: pelage dorsally deep fuscous, the hairs quite short (5 mm.), ventrally very slightly lighter and hairs slightly shorter. Ears neither reduced nor enlarged, gray. Feet and hands slender, thinly clad with short blackish hairs. Feet unwebbed and the soles lacking the granular structure of *Parahydromys* and *Hydromys*. Tail blackish above and below, the terminal cm. white. Scales rectangular; per cm. 15. Scale-hairs fine, short, blackish, about  $1\frac{1}{2}$  scale-lengths. Skull: short and broad, with the general appearance of a tiny *Parahydromys* skull. Muzzle short and heavy; nasals unshortened (but slightly exceeded by  $pmx$ ); interorbital width unconstricted, attaining half of zygomatic width; braincase broad and full (broken); zygomatic plate excised in front (as in most Hydromyinae); palate about as broad as *Pseudohydromys* (its posterior part missing), and palatal foramina larger than in *Hydromys*, their length 50 per cent of diastema; bullae larger in proportion than in any other known Hydromyine genus, width of bulla more than one-third of combined width across bullae and included basioccipital.

MEASUREMENTS.—Skin: total length, 172 mm.; tail, 92; hind foot (s.u.), 20; ear from crown, 8. Skull: length of nasals, 6.4; width of nasals anteriorly, 2.6; width muzzle just anterior to zygomatic plate, 4.2; least interorbital width, 4.4; mastoid width, 9; approximate zygomatic width, 9.2; palatal length, approximately 10; palatal foramina,  $2.5 \times 1.5$ ; diastema, 5; bullae,  $3.8 \times 2.9$ ; distance apart of bullae, 2; distance between  $m^{1-1}$ , 2.3; length  $m^1 + m^2$ , 2.4;  $m^1$ ,  $1.65 \times 0.8$ ;  $m^2$ ,  $0.8 \times 0.75$ .

The discovery of this interesting "water rat" and of the allied form whose descriptions follow, supports the already established view that New Guinea has been an important focus of development for the Hydromyinae.

The species name commemorates the fine work done for the New Guinea Expedition by its discoverer, Mr. W. B. Richardson.

*Microhydromys richardsoni* is founded upon a single specimen.

### *Hydromys habbema*, new species

TYPE.—No. 110055, Amer. Mus. Nat. Hist.; adult ♂; Lake Habbema, 15 kilometers north of Mt. Wilhelm, Netherlands New Guinea; altitude 3225 meters; August 18, 1938; collector, W. B. Richardson (field No. 4722), 1938 New Guinea Expedition. The type is a skin with skull in good condition.

GENERAL CHARACTERS.—The smallest known *Hydromys* (s.s.); hind foot not exceeding 40 mm.; while in all others 50 mm. is passed. (*Parahydromys* and *Crossomys* both attain 50 mm.). Pelage gray with silvery tips, underparts pale gray, feet and hands whitish, terminal third of tail, white. Ears small, partly hidden by fur, but not extremely reduced as in *Crossomys*.

DESCRIPTION.—Pelage of back dense, soft, of aquatic type, about 12 mm., its color Deep Mouse Gray, the tips silvery. The weak guard hairs black. No trace of the rich brown colors seen in large *Hydromys*. Underparts soft and dense, near Smoke Gray, the bases rather darker, approaching Mouse Gray. Feet and hands with very short, silvery hairs. Tail fuscous above and below, its terminal half white. Scale-hairs about three scale-lengths, increasing markedly toward the tips (as in all *Hydromys*). Ears gray, partly concealed in pelt. Skull: small and delicately built, but with all the structural characteristics of *Hydromys*. Compared with *H. chrysogaster* subspecies, that of the new species has the muzzle slightly more slender and tapered anteriorly (as in *Crossomys*), and the braincase fuller and more nearly as wide as the zygomatic expanse. The supraoccipital region is also fuller and less rugose. The pterygoids are very low, particularly at their anterior end, so that the ectopterygoid recesses have become virtually obsolete. In the palate

the tooththrows are somewhat more widely spaced, the width between  $m^{1-1}$  being rather more than twice the width of  $m^1$ . Also the palatal foramina are slightly less shortened, remaining nearly 50 per cent of diastema.

MEASUREMENTS.—Skin: total length, 317 mm.; tail, 170; hind foot, 36; ear (s.u.), 9.1. Skull: condylo-incisive length, 33.3; zygomatic width, 17.4; least interorbital width, 5.6; width of braincase, 15.6; length of nasals, 11.2; palatal length, 17.8; diastema, 8; palatal foramina,  $4.2 \times 2.1$ ; width between  $m^{1-1}$ , 4; width mesopterygoid fossa, 2.2; bulla,  $4 \times 3.4$ ; width between bullae, 5.

The species is represented in Richardson's collection by twenty-five specimens from Lake Habbema (3225 meters) and four from a camp on the NE. slope of Mt. Wilhelm (3560–3600 meters).

*Hydromys habbema* represents a new type of *Hydromys*—a very small, delicate form which in no way approaches known *Hydromys*. It seems to be the least specialized of any species, and perhaps lies near the base of that stem from which came the highly specialized *Crossomys* and *Parahydromys* and the less specialized *H. chrysogaster* and *H. neobritannicus*.<sup>2</sup>

### XENUROMYS,<sup>3</sup> NEW GENUS

A new genus of "giant rats." Dentition approximates that of *Uromys*, but tooththrows widely spaced in the palate and palatal foramina much larger. Audital bullae quite small as in *Uromys* and *Macruromys*. Zygomatic plate as broad and as well thrown forward but slopes more than in *Uromys*, and is unlike the straight to slightly excavated plate of *Macruromys*. The mandible of this rat differs in its weak development of the insertion of the masseter. In adult *Uromys* and *Rattus dominator* the masseteric ridge develops a prominent masseteric tubercle.

The teeth of *Xenuromys* besides resembling those of *Uromys*, recall those of certain *Rattus*, especially the *R. dominator* group of Celebes. But from *Rattus* they differ, as in *Uromys*, by the relative simplicity of the laminae of the molars. In  $m^1$  and  $m^2$  the third loph is proportionately much thickened from front to back (also a *Uromys* character); and correspondingly in the lower molars the anterior loph of  $m_1$  is much reduced, while its posterior median tubercle (in *Rattus dominator* resting in an enamel bay behind loph 3) is expanded in *Xenuromys* and to a less degree in *Uromys* to form a considerable functional feature. The posterior

<sup>1</sup> Note.—In 1937 I remeasured the external ear of *Crossomys* while in London: the height from crown equalled 1 mm.

<sup>2</sup> I do not concur with Rümmler's (Mitt. Zool. Mus. Berlin, XXIII, 1, pp. 15–17) synonymizing of *Parahydromys* and *Crossomys*.

<sup>3</sup> From ξένος, strange; *Uromys*, a genus of rats.

portion of  $m_2$  shows a corresponding modification.

The relationships of this interesting new rodent may be considered to be with *Uromys* and *Rattus*, possibly near the point where the *Rattus* and *Uromys* stems diverged from each other, but after the development of *Uromys*-like dentition.

The enlarged palatal openings, broad palate and rather full braincase may be subsequent modifications analogous to those observable in *Macruromys*, from which in dentition it differs sharply.

GENOTYPE.—*Xenuromys guba*.

### *Xenuromys guba*,<sup>1</sup> new species

TYPE.—No. 152043, Amer. Mus. Nat. Hist.; adult ♂; Bernhard Camp, Idenburg River, Netherlands New Guinea; altitude 75 meters; April 14, 1939; collector, W. B. Richardson (field No. 7847), 1938 New Guinea Expedition. The type is a skin with skull, the latter with rostrum broken, the former cut over the shoulder by the snare or trap.

GENERAL CHARACTERS.—Superficially like a large gray *Uromys* with pure white underparts, the tail coarsely scaled much as in *Hyomys*, but the un-keeled scales in annular instead of spiral arrangement.

DESCRIPTION.—Skin with short, crisp pelage in which the guard hairs are few, short and little differentiated. Dorsal color grizzled gray—the hairs dark gray with whitish tips, guard hairs black; ventrally white to the roots, with tint of light cinnamon under neck and throat. Feet and hands so thinly haired as to appear naked, white. Tail with basal half fuscous, terminal half white. Tail-scales rectangular or with the terminal margin slightly bowed, toward the distal part of tail becoming narrower and more wedge-shaped; scale-hairs per scale, the median one obsolete, white, about one scale-length. Ears small but not concealed in fur, naked, fuscous. Vibrissae very long as in *Mallomys* or *Hyomys*. Skull: rather less massively built than that of *Uromys*, with ampler muzzle and braincase, the latter approaching the fullness of the braincase in *Macruromys major*. Zygomata not much expanded; small supraorbital ridges developed; skull lacking the pronounced bend in profile to be seen in the naso-frontal area of *Uromys*; palatal foramina large; palate broad; mesopterygoid fossa broad, the ectopterygoid wings unconnected with the alisphenoid at their outer, posterior tips; bullae quite small as in *Uromys*.

TEETH.—Upper incisors heavy, deeply pigmented, slightly opisthodont. Molars about as heavy as in lowland *Uromys* with the posterior loph in  $m^1$  and  $m^2$  enlarged, as indicated. Upper first molar proportionately narrower. The toothrows parallel and so widely spaced that the

width of  $m^1$  is less than half of the width between  $m^{1-1}$ .

In the lower teeth the first lamina of  $m_1$  is much reduced (as in *Uromys*, but not in *Rattus*) and the posterior tubercle of the same tooth, which lies in a median position behind the third lamina, is correspondingly enlarged and broadened. The same condition is seen with respect to the posterior tubercle of  $m_2$ . In both teeth in *Xenuromys* the tubercles when slightly worn present a large triangular pattern. In *Uromys* the pattern is that of a narrow ellipse whose long axis runs transversely across the tooth. While in *Rattus* the tubercle, though an ellipse placed as in *Uromys*, is less accentuated.

MEASUREMENTS.—Skin: total length, 591 mm.; tail, 281; hind foot (s.u.), 66; ear from crown, 25. Skull: condylo-incisive length, 62.2; zygomatic breadth, 29.0; least interorbital breadth, 9.9; breadth of braincase, 22.8; breadth of interparietal, 12.5; mastoid width, 21.2; zygomatic plate, 7.6; palatal length, 35.0; zygoma, 20.4; palatal foramina,  $9.3 \times 5.3$ ; width between  $m^{1-1}$ , 7.6; width pterygoid fossa, 6.5; bulla,  $6 \times 3.5$ ; width between bullae, 10.1; length  $m^{1-3}$ , 11.8;  $m^1$ ,  $5.7 \times 3.3$ ;  $m^2$ ,  $3.8 \times 3.0$ ;  $m^3$ ,  $2.2 \times 2.1$ ;  $m^{1-2}$ , 11.0;  $m_1$ ,  $4.7 \times 3.3$ ;  $m_2$ ,  $3.7 \times 3.1$ ;  $m_3$ ,  $2.7 \times 2.4$ .

*Xenuromys guba* is described from a single specimen caught by Mr. Richardson's native helpers in the heavy forest of the lowlands about the Idenburg River. The shattered state of the rostrum suggests it may have been killed by a blow with a stick while alive in a snare.

### *Lorentzimys nouhuysii alticola*, new subspecies

TYPE.—No. 150592, Amer. Mus. Nat. Hist.; adult ♂; 9 kilometers NE. of Lake Habbema, Mt. Wilhelmina, Netherlands New Guinea; altitude, 2700 meters; October 28, 1938; collector, W. B. Richardson (field No. 5261), 1938 New Guinea Expedition. The type is a skin with skull in good condition.

GENERAL CHARACTERS.—A mountain inhabiting form, distinguished from the lowlands *L. n. nouhuysii* by the less extreme narrowing of the ear conch to the peculiar wedge-shape of the typical form (Jentink described them as "pointed, Vespertilio-like"); by the much longer, lax pelage (Jentink wrote "the longest hair does not exceed 6 mm."); by the gray instead of whitish cheeks; by the scale-hairs of the tail being black instead of white.

DESCRIPTION OF TYPE.—Color of back darker than in typical form; Mars Brown, as opposed to between Tawny and Russet—and much darker on neck and head where it approaches Bone Brown. Underparts grayish white, with fuscous bases. The dorsal pelage, 7–8 cm.; ventral pelage, 7–8 cm. Ears naked; light

<sup>1</sup> The aeroplane, by means of which the 1938 Expedition was transported to Lake Habbema, was named "Guba." The word in Motuan dialect means storm.

brownish fuscous. Hands and feet with short blackish hairs. Tail dark above, white beneath, its scale-hairs whitish (scale-hairs black in typical form). The distal half of the posterior margin of ear not excised, the tip of the pinna thus far more obtuse than in *L. n. nouhuysii*.

Skull very similar to that of lowland form, but with slightly longer, narrower muzzle. Palate with rather prominent, rounded ridges extending from  $m^{1-1}$  to the incisors along outside of palatal foramina. Nasals considerably narrower both in front and behind. That portion of maxilla anterior to the infraorbital canal nearly flat in new race, markedly inflated in typical form.

MEASUREMENTS OF TYPE.—Skin: total length, 211 mm.; tail, 128; hind foot (s.u.), 26; ear from crown, 19. Skull: condylo-basal length, 21.9; zygomatic breadth, 12.5; interorbital width, 5.6; breadth braincase, 11.0; mastoid width, 10.2; width of interparietal, 8.2; palatal length, 11.8; diastema, 5.9; zygomatic plate, 1.85; palatal foramina,  $2.6 \times 1.4$ ; breadth between  $m^{1-1}$ , 2.6; mesopterygoid fossa, 1.0; bulla,  $3.4 \times 2.6$ ; width between bullae, 4.1; molars,  $m^{1-2}$ ,  $2.8$ ;  $m^1$ ,  $1.4 \times 0.9$ ;  $m^2$ ,  $0.9 \times 0.9$ ;  $m^3$ ,  $0.6 \times 0.7$ .

Besides the type specimen of this race, Richardson found three paratypes, three additional specimens from the Bele River (2200 meters), 10–15 miles NE. of the type locality, and seven others from the camps on the ridge just south of the Idenburg River at altitudes between 1500 and 1800 meters.

To this race I refer a specimen (No. 108454) which I trapped at Kagi (1600 meters) on the Kokoda Road, Papua, in March, 1937, and tentatively the two animals collected in the Astrolabe Mountains, which Rümmler<sup>1</sup> referred to the lowland form.

In our collections we have two specimens which I believe referable to true *nouhuysii*: No. 105036, a female from the upper Fly River, altitude 80 meters, and No. 152087, a young male from near Bernhard Camp, Idenburg River, 850 meters. Both have the clear cinnamon-colored, short pelage mentioned by Jentink. Ears and face (damaged by trap) cannot be studied in the Idenburg specimen. But in the Fly River animal the cheeks are white and the ears extraordinarily narrowed and wedge-shaped, the angle formed by anterior and posterior margins only slightly exceeding  $45^\circ$ . Unfortunately the skull of the Iden-

burg specimen is in fragments, but that of the mouse from the Fly River, though the braincase is much broken, has the rostrum complete and the palate nearly so.

From that specimen I determined the mammary formula in the field, namely:  $1-2 = 6$ . The specimen contained two embryos.

#### POGONOMELOMYS RÜMMLER

*Pogonomelomys* RÜMMLER, 1936, Zeits. f. Säugetierk., XI, p. 252.

"*Melomys* with 3-haired tail scales" TATE, 1936, Bull. Amer. Mus. Nat. Hist., LXXII, p. 592.

*Pogonomelomys* RÜMMLER, 1938, Mitt. Zool. Mus. Berlin, XXIII, heft 1, pp. 99, 166.

When studying *Melomys mayeri*, the genotype of *Pogonomelomys* designated by Rümmler, neither he nor I wrote of the significant modification of the terminal 3 cm.  $\pm$  of the skin of the dorsal surface of the tail (though his use of the term *Pogonomelomys* suggests he suspected it). The presence of an additional specimen in Richardson's collection, plus his notes on the manner of prehension with the tail in the case of a further species described beyond, whose actions while alive were watched by Richardson, has brought this character sharply to my attention.

In both the new specimen of *mayeri* (No. 152364) from the Idenburg River at 400 meters and in the co-types collected by Shaw Mayer in the Weyland range at 1600 meters this caudal modification is expressed through replacement of the large, obvious scales by a nearly smooth, less pigmented tactile surface. This new character, namely, the ability to flex the tip of the tail dorsally and probably to use it for prehension, added to those already set forth by Rümmler and myself as distinguishing *M. mayeri* from *Melomys* (s.s.), warrants in my opinion full generic separation of *Pogonomelomys*. The great difference between the dentitions of *Pogonomys* and *Pogonomelomys* seems to insist that the development of such peculiar type of caudal prehension has come about independently. *Pogonomelomys* must be regarded as a highly specialized offshoot of the stock from which *Melomys*, *Xenuromys* and *Uromys* have risen.

<sup>1</sup> Rümmler, 1938, Mitt. Zool. Mus., Berlin, XXIII, heft 1, p. 57.

At Genoa in 1937, with the kind permission of Dr. de Beaux I studied the type of *bruinjii*. That animal, a female from Salawatti is very large, far exceeding in size *mayeri* and a new form from the Fly River whose description follows.

Rümmler included, with the climbing *bruinjii* and *mayeri*, two smaller, terrestrial-footed species, *sevia* from Huon Peninsula and *fraterculus* from Ceram. It is questionable whether they ought now to be included; *sevia* at least, of which Richardson took three closely related specimens at Lake Habbema, has no trace of specialized tail structure. But a large series of another small species having prehensile tail and scampering feet is tentatively referred to *Pogonomelomys*.

***Pogonomelomys bruinjii brassi*, new subspecies**

TYPE.—No. 105033, Amer. Mus. Nat. Hist.; adult ♂; Oroville Camp, Upper Fly River, 30 miles above d'Albertis Junction; altitude 60 meters; collector, G. H. H. Tate, 1936 New Guinea Expedition. The type is a skin with skull in good condition.

GENERAL CHARACTERS.—A large brownish-gray rat with large tail-scales, scandent, large-clawed feet and dorsally prehensile tip to tail. It was present with true *Pogonomys mollipilosus* and in the field was confused with it.

DESCRIPTION.—Dorsal pelage slightly crisp, not short, essentially as in *mayeri*, the color grayer, less rufous; ventral color white to the base as in *bruinjii* and *mayeri*; ears fuscous; both hands and feet whitish, a narrow brown streak extending down the back of foot to between bases of 3rd and 4th digits; tail longer than body, fuscous above and below, with distinctive dorsally prehensile tip; tail-scales large, hexagonal, 9 per cm.; scale-hairs 3 per scale, about 1/3 scale-length, becoming near tip 2/3 of scale-length; ears small. Skull, massive, well arched in profile, with the well-developed supra-orbital ridges, general palatal and dental structure and the full, rounded bullae of *bruinjii* and *mayeri*. It diverges from *bruinjii* chiefly by its much smaller size, and from *mayeri* by being decidedly larger, particularly in the enlargement of the bulla and the development of a strong posterior palatal spine.

MEASUREMENTS.—Skin: total length, 370 mm.; tail, 197; hind foot (s.u.), 33. Skull<sup>1</sup>: condylo-incisive length, 37.5 (—; 34.0); zygomatic width, 20.4 (23.4; 19.9); interorbital width, 6.7 (7.2; 5.9); breadth of braincase, 15.4 (17.4; 15.0); diastema, 11.0 (12.7; 9.4); palatal

length, 20.2 (22.6; 17.7); length palatal foramina, 5.1 (5.1; 5.2); breadth mesopterygoid fossa, 3.3 (3.5; 3.1); bulla, length, 5.8 (—; 4.7);  $m^{1-3}$ , 7.1 (8.1; 6.5); width  $m^1$ , 1.9 (1.95; 1.75).

*P. b. brassi* is based upon the type and a part-grown female topotype without skull. The close kinship of *bruinjii*, *mayeri* and *brassi* is emphasized here. They are large *Melomys*-toothed rats with broad feet, very large claws and dorsally prehensile tails.

The new form is named for Mr. L. J. Brass, the botanist who accompanied all three of the Archbold Expeditions to New Guinea.

***Pogonomelomys rümmleri*, new species**

TYPE.—No. 150669, Amer. Mus. Nat. Hist.; young adult ♂; Lake Habbema, north slope of Mt. Wilhelm, Netherlands New Guinea, altitude 3225 meters; July 26, 1938; collector; W. B. Richardson (field No. 4523), 1938 New Guinea Expedition. The type is a skin with skull, in good condition.

GENERAL CHARACTERS.—A small dark brown rat with *Melomys*-like dentition, feet unmodified for climbing (compare *P. mayeri*) but with dorsal 3 cm. of tail provided with tactile surface for prehension.

DESCRIPTION.—Skin with rather long fur (12 mm.), colored above near Bone Brown, becoming Clove Brown along the back, the face with a grayish cast; underparts grayish white, the long pelage with fuscous bases which show through. Hands and feet clothed with light yellow-brown hairs. Ears fuscous. Tail brown; the scales small and lacking the prominent keeled structure of true *Melomys*, their scale-hairs blackish, 3 per scale and from 2 to 3 scale-lengths (compare *P. mayeri*). Skull much smaller than that of *P. mayeri*, the rostrum much compressed and less shortened; supraorbital ridges undeveloped; braincase fuller; zygomatic plate much narrower, and nearly straight as in *Macruromys*; palate with elongate anterior foramina and quite large posterior foramina; back of palate even with back of  $m^3$ ; bullae small; angular process of mandible quite short. Incisors narrow, unbroadened, orange. Molars very small and of characteristically simple *Melomys* type.

MEASUREMENTS.—Skin: total length, 242 mm.; tail, 138; hind foot, 25; ear from crown, 17. Skull: condylo-incisive length, 26.1; zygomatic width, 16.2; nasals,  $10.3 \times 2.8$ ; interorbital width, 4.5; width of braincase, 14.0; interparietal, 10.5; mastoid width, 10.8; zygomatic plate, 2.7; palatal length, 13.9; diastema, 7.3; palatal foramina,  $6.0 \times 2.1$ ; mesopterygoid fossa (taken between pterygoids), 1.9; bulla,  $4.2 \times 3.1$ ; distance apart of bullae, 3.6;  $m^{1-3}$ , 4.4;  $m^1$ ,  $2.0 \times 1.4$ .

<sup>1</sup> Measurements of type of *bruinjii* and of co-type (No. 101954) of *mayeri* follow in parentheses.

*Pogonomelomys rümmleri* is founded upon an exceptionally fine series of thirty specimens from the type locality and fifteen more from Wilhelmina Top, 300 meters higher. Many of the old specimens show a distinct tawny wash over the tips of the ventral hairs. Adult specimens not necessarily old also show great wear of the molars, probably accountable by conditions of soil and vegetation in their habitats.

#### PLANIGALE TROUGHTON

*Planigale* TROUGHTON, 1928, Records Australian Mus., XVI, p. 282.

Wood Jones<sup>1</sup> drew attention to many characters of the Australian Phascogalinae, among then distinguishing between "*Phascogale*" (*Phascogale* and *Antechinus*) and *Sminthopsis*. His illustrations particularly showed characters of *P. flavipes*, type of *Antechinus* and of *S. crassicaudata*, type of *Sminthopsis*, comparing the short foot with striated pads of the former with the slender foot with granulated pads of the latter. In the skulls he noted distinctions in the interorbital area and the nasals.

Iredale and Troughton<sup>2</sup> have separated *Phascogale* Temminck and *Antechinus* Macleay. The former contains only the brush-tailed *tapoatafa* (the genotype) and *calura*, in both of which the bulla is relatively greatly enlarged and the periotic is also inflated. Thus *Antechinus* contains generalized forms while species referable to *Phascogale* (s.s.) and *Sminthopsis* show specializations.

The majority of the Phascogalinae from New Guinea have striated pads, rather short feet, small bullae and moderately broad interorbital region, thus fitting in with *Antechinus* and *Phascogale* rather than with *Sminthopsis*.

The tooth succession in the "phascogales" is an important feature which must be understood when working upon their classification. Usually material for study of this process is lacking but in the case of *Antechinus melanura* several young specimens in our collection demonstrate it perfectly:

American Museum numbers 109794 ♀ and 105854 ♀: incisors, canines,  $p_1^1$ ,  $p_3^3$ ,  $m_{1-3}^{1-3}$  are fully in place;  $p_4^4$  changing (several of the four minute milk premolars still in place and the tips of the permanent set plainly visible);  $m_{4-4}$  virtually in place, but  $m_{4-4}$  only half erupted.

American Museum numbers 105795 ♂, 152034 ♀, and 108562 ♀ (younger): the minute, 2-rooted milk  $p_4^4$  undisturbed,  $m_3^3$  half erupted;  $m_4^4$  undeveloped. In this specimen milk  $p_4$  is vestigial and single-rooted, and remains, like certain bats' teeth excluded at the outer margin of the toothrow.

These dental changes take place at a very early age—when the animal has reached only about one-half of its adult weight.

The vestigial condition of the milk  $p_4^4$ , especially of the single-rooted tooth of the lower jaw may account for Lönnberg's belief that the absence of the "lower secator" of his *Phascogale subtilissima* (a *Planigale*) is a generic character. On the other hand, photographs of the skull of his type in my possession show the upper permanent fourth premolar to be large and completely erupted, though unworn. So permanent  $p_4$  of his species may really never develop.

It has yet to be shown that the tooth succession indicated for *melanura* prevails among other species. Nevertheless, minute, obsolescent, or seemingly obsolete fourth premolars should be viewed with suspicion. For normally, in adult animals  $p_4^4$  are the largest or next to largest of the premolars.

*Planigale* appears to be related to *Antechinus* but differs by its much flattened, widened skull; short, wide palate and rostrum; heavy feet, with pads faintly striated.<sup>3</sup>

The form described beyond had the skull markedly flattened. Unfortunately, by some accident the entire braincase behind the broad interorbital region has been broken and destroyed, and specific characters can be based only upon what remains and upon skin characters.

#### *Planigale novaeguineae*, new species

TYPE.—No. 108561, Amer. Mus. Nat. Hist.: adult ♂; Rona Falls, near Port Moresby, Cen-

<sup>3</sup> Troughton describes the pads of *P. i. brunneus* as granulated, "the granulations comparatively large." I found faint striations, not granulations.

<sup>1</sup> Wood Jones, 1923, The Mammals of South Australia, pp. 94-122.

<sup>2</sup> 1934, A check list of the mammals recorded from Australia, p. 7.

tral Division, Papua; altitude 250 meters; Jan. 20, 1937; collector, G. H. H. Tate, 1936 New Guinea Expedition. The type is a skin in good condition and skull with posterior half missing.

**GENERAL CHARACTERS.**—A small brownish-gray marsupial mouse, with very low ears deeply notched at their posterior margins; heavy short feet; and tail shorter than head plus body.

**DESCRIPTION.**—Skin: dorsal color brownish gray, formed by a mixture of short, light brown, black-tipped hairs and inconspicuous black guard hairs; ventral color light tan, gray-based, except chest and throat where the hairs are light brown to bases. Hairs of scrotum vinaceous; of hands and feet pale brown; those of tail fuscous above, light brown beneath. Ears peculiar, very low, projecting 7 mm. above crown, but rather ample posteriorly, the opening from meatus to outer pinna very high (7 mm.). (Note that the ears shown by Troughton, plate 39, have been revolved. Their vertical height parallels a diagonal line from upper left to lower right across the page.) The posterior margin of the pinna in *novaequineae* is deeply notched. Ear finely haired internally and externally. Faint traces of striations on pads (rest of foot normally granulated as in *Antechinus* and other genera). Skull: when newly caught the specimen had the braincase extremely flat and low. Destruction of the braincase precludes demonstration of that fact. Rostrum heavy, broad and flat extending backward to broad interorbital region; nasals twice as broad proximally as distally, without notch between them at tips (as in *Antechinus flavipes*); palate much broken, its incisive foramina reaching back only to middle of canine alveoli (posterior vacuities destroyed).

Incisors:  $i^{1-1}$  twice the size of other incisors, not contiguous;  $i^{3-4}$  subequal, slightly larger than  $i^2$ ; lower incisors absent (alveoli only). Canines straight, slender. Premolars: appearing crowded, becoming successively and sharply larger from  $p^1$  to  $p^3$  to  $p^4$ , all with high triangular blades and 2-rooted; each lower premolar with a "heel," especially well developed in  $p_3$ ;  $p_1$  absent (2-rooted) but unquestionably larger than reduced  $p_4$ , and much smaller than  $p_3$ ;  $p_4$ , though very small and single-rooted, is apparently a permanent tooth, not to be confused with the minute milk  $p_4$  of the deciduous dentition ( $m_4^4$  completely in place).

**MEASUREMENTS.**—Skin: total length, 170 mm.; tail, 78; hind foot (s.u.), 14; ear from crown, 7. Skull: nasals,  $9.3 \times 4.1$ ; interorbital width, 6.1; anterior palatal foramina,  $1.8 \times 1.5$ ; length toothrow, 10.8;  $m^{1-3}$ , 4.3; crown of  $m^1$ ,  $1.7 \times 1.2$ ;  $m^2$ ,  $1.4 \times 1.6$ ;  $m^3$ ,  $0.75 \times 1.7$ .

Intensive trapping about the great rock-strewn slope where this animal was caught failed to produce any more. It was taken in a dryish place beneath an overhanging

rock. The hillside was comparatively barren of vegetation.

*Planigale novaeguineae* is decidedly larger than any hitherto described (*ingrami*, *brunneus*, *tenuirostris* and *subtilissima*)—all from Australia.

### *Antechinus tafa centralis*, new subspecies

**TYPE.**—No. 109823, Amer. Mus. Nat. Hist.; adult ♂; Bele River, 18 kilometers north of Lake Habbema, north of Mt. Wilhelmina, Netherlands New Guinea; altitude 2200 meters; Nov. 17, 1938; collector, W. B. Richardson, 1938 New Guinea Expedition. The type is a skin with skull in good condition.

**GENERAL CHARACTERS.**—Separable from true *tafa* only by cranial characters described below.

**DESCRIPTION.**—Skin: above dark gray, with a glint of light brownish, grayer on head; beneath dull grayish white with gray bases; transition from dorsal to ventral color not well defined. Ears fuscous. Hands and feet with light gray hairs. Tail brownish gray, becoming yellowish gray beneath—the tip with slight hair pencil. Skull, distinguished from that of true *tafa* by the following characters: enlargement of the posterior palatal fenestrae; marked increase in internal width of the mesopterygoid fossa just behind palate.

**MEASUREMENTS.**<sup>1</sup>—Skin: total length, 281 mm. (279); tail, 146 (145); hind foot (s.u.), 26 (24); ear from crown, 15 (17). Skull: condylo-incisive length, 34.3 (32.0); zygomatic width, 19.2 (17.1); least interorbital width, 7.8 (7.7); width braincase, 13.9 (13.4); palatal length, 18.0 (17.0); posterior palatal fenestrae, 4.0 (3.4); greatest inside width of mesopterygoid fossa, 4.5 (3.8); bulla, length, 3.9 (3.1); toothrow,  $i^{1-m^4}$ , 17.6 (17.3);  $m^{1-4}$ , 7.3 (7.5);  $m^{1-3}$ , 6.3 (6.3); width  $m^1$ , 1.7 (1.7). The smaller size which shows throughout is due to the type of true *tafa* being a female. In a female (No. 109809) of *A. t. centralis* the width of the mesopterygoid fossa is 4.3, and the length of the fenestrae, 4.1.

The new race is represented by a total of 22 specimens from localities near Mt. Wilhelmina, varying from 1500 to 2800 meters.

### *Antechinus habbema*, new species

**TYPE.**—No. 109812, Amer. Mus. Nat. Hist.; adult ♂; 9 kilometers NE. of Lake Habbema, north slope of Mt. Wilhelmina, Netherlands New Guinea; altitude, 2800 meters; collector, W. B. Richardson, 1938 New Guinea Expedition. The type is a skin with skull in good condition.

**GENERAL CHARACTERS.**—Astonishingly like *A. tafa centralis*, whose upper distributional range it shares. Differing by the much smaller, more delicate feet and hands, and much smaller

<sup>1</sup> Measurements of *A. tafa tafa* are placed in parentheses.



teeth. Its nearest relative must nevertheless be regarded as *A. tafa*.

DESCRIPTION.—Skin: color and quality of pelage above and below almost exactly that of *A. tafa centralis*. Ears fuscous. Tail above as *A. t. centralis*, beneath darker, the hairs fuscous. Feet and hands much smaller and more delicately formed; the width of foot across base of 5th metatarsal, 3.7, in *A. t. centralis*, 5.1, and in the type of *A. t. tafa* (♀), 4.3. Skull: general character of *tafa* but smaller. Back of palate well behind  $m^{4-4}$ , and supplementary fenestrae appearing between the posterior palatal fenestrae and the back of palate. Teeth smaller, molars also narrower than in *tafa*.

MEASUREMENTS.—Skin: total length, 252 mm.; tail, 140; hind foot (s.u.), 21; ear from crown, 13. Skull: condylo-incisive length, 29.6; zygomatic breadth, 6.5; least interorbital width, 7.7; width of braincase, 13.0; palatal length, 15.7; posterior palatal foramina (primary), 3.9, (secondary) 0.8; width mesopterygoid fossa, 3.7; length bulla, 2.9; toothrow,  $i^1-m^4$ , 14.6;  $m^{1-4}$ , 6.1;  $m^{1-3}$ , 5.3; width  $m^1$ , 1.4.

This species (it must be so considered) is founded upon five specimens. It was taken from 2200 to 2800 meters in the neighborhood of Lake Habbema.

#### *Sminthopsis* in South New Guinea

Thomas<sup>1</sup> described a species *rufigenis* from the Aru Islands which he compared with *S. virginiae* Tarragon from North Queensland. A few years ago I published a description<sup>2</sup> of *Phascogale rona* from

Rona, near the Laloki River, Central Division, Papua.

While working the savanna country of the middle Fly River at Lake Daviumbu a large series of more than 60 specimens of this interesting little marsupial was secured. Eight more were trapped at Tarara, Wassi Kussa. The big series at Daviumbu could be secured because of the interdigitation of tongues of low grass-savanna with swamps and flooded extensions of the lake. Burning of some of the grass areas resulted shortly in a high concentration of a previously well-dispersed mammal fauna among the unburned vegetation at the waterside.

In the summer of 1937 I was privileged to visit the British Museum (Natural History) and study among other types that of *rufigenis*. I was struck with the close relationship of my large series from Daviumbu to the types of *rufigenis* and *rona*. Further study establishes that all have nasals unwidened behind, narrow feet and pads distinctly granulated instead of striated, and are thus members of the genus *Sminthopsis*—atypical members it is true, since the tails do not become swollen.

Many of the females had young in the pouch. Mammary formula invariably 3 pairs = 6.

<sup>1</sup> Thomas, 1922, Ann. Mag. Nat. Hist., (9) IX, p. 265. 1922, Nova Guinea, XIII, pp. 739-740.

<sup>2</sup> Tate and Archbold, 1936, Amer. Mus. Novitates, No. 823, p. 2.

